CLAIMS

1. A process for reducing the sulfur content of a hydrocarbon feedstock having an initial boiling point of not less than about 100°C and a 95% boiling point of about 450°C or less and a sulfur content not greater than about 2 wt. % to a sulfur content of less than about 200 ppm, comprising contacting said feedstock with a catalyst comprising a Group VIB metal component, a Group VIII metal component, and an S-containing organic additive at a temperature from about 200 to about 450°C, a hydrogen partial pressure from about 5 to about 200 bar, a liquid hourly space velocity from about 0.1 to about 10 vol./vol.h and an H_2/oil ratio from about 50 to about 2000 Nl/l.

112 → What Happen?

2. The process of claim 1, wherein the sulfur content of the product is less than about 50 ppm.

3. The process of claim 1, wherein the S-containing organic additive is a mercaptocarboxylic acid represented by the general formula HS-R1-COOR, wherein R1 stands for a divalent hydrocarbon group with 1 to about 10 carbon atoms and R stands for a hydrogen atom, an alkali metal, an alkaline earth metal, ammonium, or a linear or branched alkyl group having 1 to about 10 carbon atoms.

4. The process of claim 1, wherein the sulfur content of the feedstock is between about 150 ppm and about 2 wt.%.

5. The process of claim 4, wherein the sulfur content of the feedstock is between about 0.1 wt.% and about 2 wt.%.

6. The process of claim 4, wherein the sulfur content of the feedstock is between about 150 ppm and about 500 ppm.

7. The process of claim 1, wherein said feedstock is contacted with said catalyst at a temperature from about 280 to about 430°C.

8. The process of claim 1, wherein said hydrogen partial pressure is from about 10 to about 100 bar.

9. The process of claim 1, wherein said hydrogen partial pressure is from about 15 to about 60 bar.

10. The process of claim 1, wherein said liquid hourly space velocity is from about 0.5 to about 4 vol./vol.h.

11. The process of claim 1, wherein said H_2/oil ratio is from about 80 to about 1000 Nl/l.

12. A process for reducing the sulfur content of a hydrocarbon feedstock having an initial boiling point of not less than about 100°C and a 95% boiling point of about 450°C or less and a sulfur content not greater than about 2 wt. % to a sulfur content of less than about 200 ppm, comprising contacting said feedstock with a catalyst at a temperature from about 200 to about 450°C, a hydrogen partial pressure from about 5 to about 200 bar, a liquid hourly space velocity from about 0.1 to about 10 vol./vol.h and an H_2/oil ratio from about 50 to about 2000 Nl/l, said catalyst comprising a Group VIB metal component, a Group VIII metal component, and an S-containing organic additive, said catalyst being subjected to a sulfidation step and/or activation step before contact with said feedstock.

13. The process of claim 12, wherein the sulfur content of the product is less than about 50 ppm.

14. The process of claim 12, wherein the S-containing organic additive is a mercaptocarboxylic acid represented by the general formula HS-R1-COOR, wherein R1 stands for a divalent hydrocarbon group with 1 to about 10 carbon atoms and R stands for a hydrogen atom, an alkali metal, an alkaline earth metal, ammonium, or a linear or branched alkyl group having 1 to about 10 carbon atoms.

15. The process of claim 12, wherein the sulfur content of the feedstock is between about 150 ppm and about 2 wt.%.

16. The process of claim 15, wherein the sulfur content of the feedstock is between about 0.1 wt.% and about 2 wt.%.

17. The process of claim 15, wherein the sulfur content of the feedstock is between about 150 ppm and about 500 ppm.

18. The process of claim 12, wherein said feedstock is contacted with said catalyst at a temperature from about 280 to about 430°C.

19. The process of claim 12, wherein said hydrogen partial pressure is from about 10 to about 100 bar.

20. The process of claim 12, wherein said hydrogen partial pressure is from about 15 to about 60 bar.

21. The process of claim 12, wherein said liquid hourly space velocity is from about 0.5 to about 4 vol./vol.h.

22. The process of claim 12, wherein said H_2/oil ratio is from about 80 to about 1000 Nl/l.

23. A two-step process for converting a starting feedstock having an initial boiling point of not less than about 100°C and a 95% boiling point of about 450°C or less and having a sulfur content of above about 0.1 wt.% and not greater than about 2 wt.% into a product having a sulfur content of about 200 ppm or less, wherein the process comprises contacting said feedstock with a first catalyst followed by contact with a second catalyst, both catalysts comprising a Group VIB metal component and a Group VIII metal component, with at least said second catalyst additionally comprising an S-containing organic additive, the conditions for said contact with both catalysts being the same or different and comprising a temperature from about 200 to about 450°C, a hydrogen partial pressure from about 5 to about 200 bar, a liquid hourly space velocity from about 0.1 to about 10 vol./vol.h and an H_2/oil ratio from about 50 to about 2000 Nl/l, the effluent from contact with said first catalyst having a sulfur content of less than about 0.1 wt.%, and the product after contact with the second catalyst having a sulfur content of less than about 200 ppm.

24. The process of claim 23, wherein the effluent following contact with said first catalyst is contacted with said second catalyst after fractionation or intermediate phase separation.

25. The process of claim 23 wherein the first catalyst comprises molybdenum as Group VIB metal component and cobalt and/or nickel as Group VIII metal component, while the second catalyst comprises molybdenum as Group VIB metal component and nickel as Group VIII metal component.

26. A two-step process for converting a starting feedstock having an initial boiling point of not less than about 100°C and a 95% boiling point of about 450°C or less and having a sulfur content of above about 0.1 wt.% and not greater than about 2 wt.% into a product having a sulfur content of about 200 ppm or less, wherein the process comprises contacting said feedstock with a first catalyst followed by contact with a second catalyst, the conditions for said contact with both catalysts being the same or different and comprising a temperature from about 200 to about 450°C, a hydrogen partial pressure from about 5 to about 200 bar, a liquid hourly space velocity from about 0.1 to about 10 vol./vol.h and an H_2/oil ratio from about 50 to about 2000 Nl/l, the effluent from contact with said first catalyst having a sulfur content of less than about 0.1 wt.%, and the product after contact with the second catalyst having a sulfur content of less than about 200 ppm, both of said catalysts comprising a Group VIB metal component and a Group VIII metal component, with at least said second catalyst additionally comprising an S-containing organic additive, said first catalyst and/or said second catalyst being subjected to a sulfidation step and/or activation step before contact, respectively, with said feedstock or contact with the effluent from contact with said first catalyst.

27. The process of claim 26, wherein the effluent following contact with said first catalyst is contacted with said second catalyst after fractionation or intermediate phase separation.

28. The process of claim 26 wherein the first catalyst comprises molybdenum as Group VIB metal component and cobalt and/or nickel as Group VIII metal component, while the second catalyst comprises molybdenum as Group VIB metal component and nickel as Group VIII metal component.